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Stigmatization of drinking patients with liver cancer: The role of socioeconomic status

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ABSTRACT

Patients with liver cancer may face stigmatization due to cancer, alcohol consumption, or both. This study addresses gaps in the existing literature regarding stigmatization of alcohol-related liver cancer patients, particularly its connection with socioeconomic status (SES). The study explores whether the SES of a fictional character with alcohol addiction and liver cancer influences stigma levels reported by participants. Additionally, it investigates how participants' personal characteristics, such as alcohol consumption and healthcare professional status, impact stigmatization. This study aims to provide new insights regarding the role of stigmatization in liver cancer treatment and management, emphasizing in socioeconomic determinants. The method is based on three scenarios describing a woman character with alcohol abuse and liver cancer. The scenarios depicted a woman character with either low, medium or high SES. Each participant (N = 991) was randomly assigned to one of the three scenarios. After reading it, each participant answered questionnaires assessing negative attitudes towards the character. Four scales were used: *"Negative attributions about people with health problems"*, *"Causality of cancer"*, *"Controllability of drinking"* and *"Reluctance to helping behavior"*. Data were analyzed using ANOVA and t-tests. The scenario describing a character with a low SES significantly received more *"Negative attributions about people with health problems"* than the character with medium or high SES. Participants having higher alcohol consumption themselves showed lower stigma scores for three out of four scales than participants with lower consumption. In addition, participants identified as health professionals had lower stigma scores regarding the scales *"Negative attributions about people with health problems"* and *"Controllability of drinking"*, and higher scores for the subscale *"Reluctance to helping behavior"*, compared with non-professionals. A character with low SES received more negative attributions than the one with higher SES. Participants' own alcohol consumption and professional status (being health professional or not), influenced their stigmatizing attitudes.

1. Introduction

Globally, liver cancer is the sixth most diagnosed cancer, representing almost a million of new cancer cases every year, and within those cases, 30% are diagnosed in women [1,2]. Liver cancer is thus, after lung cancer, a leading cause of death due to cancer, thereby constituting a major public health challenge [2,3]. Along with its role in other liver diseases like cirrhosis, alcohol has been identified

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as an important risk factor in the development of liver cancer, increasing the risk of developing liver cancer by 3 to 10-fold, [4–9].

Several studies showed that patients diagnosed with liver cancer, in addition to experiencing physical pain, may undergo negative psychological consequences, such as depression and anxiety, and a marked decrease in quality of life [3,10–14]. These psychological outcomes can also be associated with poor adherence to treatments, which can lead to a decrease in survival rates [12] or an increase in suicidal risk [15].

1.1. Liver cancer, alcohol consumption, stigma and socioeconomic status

Another possible negative consequence of liver cancer is the stigmatization attributed to cancer, alcohol consumption, or both [13]. Stigma can be defined as an attribute that discredits someone as different, which can lead to a spoiled identity, i.e., the feeling of being inferior, "defective" and socially unwanted [16,17]. Regarding individuals with health issues, stigma can be defined as a social process marked by exclusion, rejection, blame, or devaluation, it arises from the experience, perception, or anticipation of negative social judgments resulting from a lasting health-related identity [18]. Within the literature, the stigmatization of individuals with health issues is assessed through various variables including negative attributions and blames towards patients, beliefs about personal responsibility and controllability of behaviors, as well as helping behaviors towards patients [19–26]. The concept of stigma is also intricately linked to that of social support, as it has been demonstrated that social support not only notably mitigates the adverse effects of stigma on the psychological well-being of patients but also contributes to fostering resilience and enhancing physical health, especially in the case of liver cancer [27,28]. Conversely, social rejection, measured as one dimension of stigmatization, negatively impacts the quality of life of cancer patients [29].

The concept of personal responsibility is at the heart of stigmatization [30], especially in liver diseases [31,32]. Indeed, according to the attribution theory, individuals have more stigmatizing attitudes towards persons with cancer if they identify behaviors that might be responsible for the disease, a situation that can be found in substance use behaviors [33,34], especially alcohol [31]. In fact, the general public's representation of liver disease often includes the idea that a patient's disease was caused by alcohol consumption, which may be true or not [32,35,36]. As a consequence, patients with liver diseases may experience stigma and a strong feelings of shame [37,38]. Several studies showed that stigma can cause considerable distress in liver cancer patients [37,38], increasing the risk of depression and anxiety [39,40] and decreasing patients' quality of life [13].

In addition, fear of stigma could significantly decrease or delay individuals' adherence to screening campaigns or care seeking [41,42], as well as patients' adherence to treatments once the diagnosis is made [37,43–45]. The development of effective screening campaigns is crucial [46], given that regular screening could significantly reduce liver cancer-related mortality [47]. Therefore, it seems necessary to counterbalance stigmatizing attitudes towards people with liver disease, especially in the healthcare context [30]. However, achieving this goal would first require to identify factors influencing the stigmatization around liver cancer and drinking.

Socioeconomic status (SES) can be defined as "the position of an individual in a social system that affects prestige, the ability to obtain social resources and power" [21,48]. Reports have found that a low SES was associated with developing liver diseases and that the SES level was negatively correlated with the level of alcohol consumption [49,50]. Moreover, a low SES in patients with liver disease was found to have dramatic consequences, including reduced access to health-care and decrease in survival [51,52]. In addition, in the case of patients with advanced-stage cancers and low SES, high levels of distress and increased barriers to managing this distress have been demonstrated, resulting in negative influence on patients' quality of life [53].

Besides liver diseases, SES has been shown to be a characteristic that can lead to stigma from others, as studies have shown that people with a low SES seem to be more stigmatized than people with a medium or high SES [54–56]. Regarding stigmatization perceived by patients, according to a systematic literature review, individuals with lower SES are more likely to feel regrets regarding their consumption, tend to be more aware of public stigma, and internalize it to a greater extent. In contrast, those with higher SES are better able to emotionally distance themselves from the stigma associated with their consumption [57]. In individuals with liver cancer, addictions and low SES, a study showed that stigmatization was negatively linked to healthcare access, in comparison with comparable individuals with higher SES [58].

In order to study the processes involved in stigmatization, a recent study examining nursing students' perception of substance abuse in relation to SES, revealed that fictional characters presenting both a substance addiction and a low SES, faced more stigma compared to those with the same addiction but a higher SES [21].

Hypothesis 1. Participants confronted with the scenario depicting a female character with low SES would present higher stigma scores when compared to participants confronted with the scenario describing the character with higher SES.

1.2. Health professionals, alcohol consumers and stigmatization

Studies have shown that stigmatizing individuals' lack of knowledge regarding liver disease constitutes an important factor in the stigmatization process of patients presenting a liver disease [13,45,59]. A recent study has shown that, contrary to general belief, healthcare professionals are less likely to bear negative judgments on individuals with alcohol-related cancer [60]. Nevertheless, other studies have revealed that patients can also be stigmatized by health professionals [41,61]. Indeed, similarly to community individuals (lay persons), health professionals can have negative attitudes towards patients, notably those with behaviors identified as risk factors for cancer, such as alcohol consumption [21,62,63].

Hypothesis 2. Participants from the health professional subsample would express different stigma scores compared to the subsample of participants who were not health professionals.

Another factor that could influence the level of stigmatization of liver cancer patients by individuals might be these individuals' own level of alcohol consumption. Indeed, a study exploring stigma towards smoking in lung cancer showed that participants who were smokers themselves were less stigmatizing than non-smokers [19]. This rationale could therefore apply to alcohol consumption in the case of liver cancer.

Hypothesis 3. Participants with higher alcohol consumption would express lower stigma scores than participants with lower consumption.

The present study aimed to study factors influencing the stigmatization of both liver cancer and alcohol consumption. We thus used a method based on three fictional scenarios presented to participants who, after reading one of the three scenarios, were instructed to answer different items enabling the measurement of their level of stigmatization regarding the fictional character. This methodology was grounded on a report addressing stigma in lung cancer [19]. In the present study, the scenarios depicted a 42-year-old woman's drinking habits who was recently diagnosed with liver cancer. Each scenario had a common base and only the description of the character's SES differed between the three scenarios: the character was depicted with a low, medium or high SES. The character's age and gender were chosen with regards to previous studies showing that having an age similar to the character depicted in the scenario, being a female drinker and recently diagnosed with liver disease increased the risk of stigma and negative psychological consequences, including symptoms of post-traumatic stress disorder and poorer quality of life [13,56,64–67]. Previous researches indicated that, regarding alcohol consumption, women may feel more stigmatized than men, which could be due to sexist attitudes and higher acceptability of drinking for men than women [68–70]. In addition, being a female was shown to increase the level of emotional distress in cancer victims [71] and to be associated with financial difficulties linked to a liver cancer diagnosis [12]. Regarding age, it has been shown that, in cases of cancers caused by avoidable behaviors, such as alcohol/tobacco consumption, younger patients are more stigmatized than older patients, and that younger individuals experience a greater sense of stigma [72]. We thus choose to describe a female character younger than the mean age of individuals diagnosed with liver cancer [73].

Previous research has highlighted that individual with liver cancer, potentially associated with alcohol consumption, experience stigma [37,38]. Previous studies showed that SES factor can contribute to stigmatization [21,54–58]. However, no study has assessed the role of SES regarding stigma towards individuals with liver cancer. This study had two objectives. Its first aim was to identify if a fictional character's SES level, with both an alcohol addiction and a liver cancer diagnosis, could influence the level of stigma from participants. The second objective was to identify whether participants' own personal characteristics, including alcohol consumption and being a health professional or not, could impact their levels of stigmatizing attitudes.

2. Method

2.1. Participants

Participants were recruited via an advertisement posted on groups referenced on Facebook in France and focusing in various domains (fitness, outdoor, music, literature, cooking, home improvement, etc.). The advertisement was also posted on LinkedIn and Instagram. Potential participants were provided with the link to an online questionnaire displayed on LimeSurvey. The inclusion criteria were an age greater than 18 years and understanding the French language. The exclusion criteria for participants were to be under 18 years old and not to understand the French language. Participants' personal information was gathered, including age, gender, marital status, number of children (if any), educational level and occupational category. A question was also assessed whether participants were health professionals or not. When the answer was "yes", participants were asked to specify to which professional category they belonged: medical doctor, nurse, paramedical professional, professional caregiver, nurse assistant, etc.

The sample size was determined using G*Power, indicating that a small effect size (<0.15) with an α value of 0.05 could be detected with a total of 690 participants [74]. The data were collected from June 2022 to January 2023. The study protocol was in accordance with the Helsinki Declaration and approved by the local ethics committee (Comité d'Ethique de la Recherche of Toulouse University, file number 2022-462) and by the Data Protection Officer of the University of Toulouse-Jean Jaurès. Participants' answers were completely anonymous and they did not receive any compensation for their participation.

2.2. Procedure

After providing informed consent, participants were randomly assigned to one of three experimental conditions (low, medium or high SES). Each condition consisted of a scenario (written in French) that described a woman character, named Anna, who frequently consumed alcohol (a bottle of wine a day) and who was recently diagnosed with liver cancer. The scenarios were the same across the three conditions, except for the character's SES which was either low, medium or high. To modulate the SES level, we used three levels of education (High school, Bachelor or Master degree, respectively), three different professional status (a supermarket cashier currently unemployed, a clerk in a small insurance company or a chief executive officer of a large telecommunication company, respectively) and three different standards of living (social welfare, small townhouse or owner of several houses, respectively). The three scenarios are presented in Appendix A. After reading the scenario, participants answered questionnaires that assessed stigma and negative attributions towards the fictional character. Following the completion of this task, participants were asked to answer a questionnaire collecting sociodemographic data and their own alcohol consumption.

2.3. Stigmatization measures

The questionnaire aiming to measure stigmatization was constructed and inspired by previous studies [19,75]. Considering that there is no scientifically validated items specifically designed for studies using scenarios, existing material from former studies [19,75] was adapted to suit this study scenarios, as the items must align with the developed scenarios. All items were measured using a 5-point Likert-type scale ranging from 1 (strongly disagree) to 5 (strongly agree), excepted the subscale "*Reluctance to helping behavior*" scored 1 = strongly agree to 5 = strongly disagree. Total scores for each variable were calculated and then averaged for analyses. The variables were the following (all items can be found in Appendix B).

2.4. Negative attributions about people with health problems

This subscale contained four items measuring negative attributions about the supposedly "poor choices", weakness or selfishness of people having health problems. Sample items included "People with health problems like Anna's tend to make poor choices" and "People with health problems like Anna's tend to have little will". A high score implies that the participant had more negative attribution towards Anna. Cronbach's α value of this subscale was [75].

2.5. Causality of cancer

This subscale contained four items assessing the causality of the liver cancer disease affecting the character. Two items were reversed in this subscale. For instance, items included "Anna caused her cancer" and "Anna's cancer is a consequence of these behaviors". A higher score suggested that the participant considered that the character had a higher responsibility in the causality of her cancer. Cronbach's α value of this subscale was [71].

2.6. Controllability of drinking

This subscale assessed participants' perceptions regarding the character's ability to control, or not, her drinking. Controllability was measured through five items, among which two items were reversed. For example, items included "Anna can choose not to drink alcohol" and "No one is forcing Anna to drink alcohol". A higher score suggested that the participant considered that the character had a higher level of control on her alcohol consumption. Cronbach's α value of this subscale was [76].

2.7. Reluctance to helping behavior

This subscale was created based on the social support theory [77] and existing social support items [75]. It contained four items measuring the possibility of exhibiting helping behaviors towards a person with health problems. A higher score suggested that the participant would have less helping behaviors towards the character. Examples of items included "If I was close to Anna, I could help her carry her groceries" and "If I was close to Anna, I could drive her to her medical appointments if she needed it". Cronbach's α value was [76].

2.8. Alcohol consumption measure

Participant's own alcohol consumption was measured with the three-item questionnaire Alcohol Use Disorders Identification Test-C (AUDIT-C; Accietto, 2003; Bush et al., 1998). Each item was scored from 0 to 4 points, resulting in total scores ranging from 0 to 12 points. Participants were assigned to the high consumption group when her/his AUDIT-C total score was $\geq$3 for women or $\geq$4 for men, or to the low consumption group when her/his total score was <3 for women or <4 for men. Cronbach's α value was [78].

2.9. Statistical analyses

The total number of answers collected was 1007. Data were screened for missing values, univariate outliers using z-scores, and multivariate outliers through Mahalanobis distance with $p < 0.001$ [79], resulting in 991 participants in the final sample. Participants' responses were analyzed using analysis of variance (ANOVA) and *t*-tests. Tukey's test was used as post-hoc. Data were analyzed using IBM SPSS Statistics version 26.

2.10. Data sharing statement

All the data and code from this study are available and can be accessed at https://doi.org/10.5281/zenodo.8186535.

3. Results

3.1. Descriptive statistics: participants' characteristics

A total of 991 participants completed the entire questionnaire (259 declared themselves as males, 720 as females and 12 as other).

Participants' mean age was 32.15 years (range 18–79; SD = 3.9). The majority of participants were female, without children and lived in a couple (Table 1). Within the sample, 375 (37.84%) participants were health professionals, with a majority of paramedical professionals and nurses ($n = 278$, 74.1%). Concerning alcohol consumption, 587 participants (59.23%) had high consumption and 404 (40.77%) low consumption.

3.2. Testing hypothesis 1: influence of the fictional character's SES level on participants' stigma scores

The aim of this analysis was to test hypothesis 1, predicting that participants confronted with the scenario depicting a character with low SES would present higher stigma scores when compared to participants confronted with scenarios describing a character with higher SES. To test this hypothesis, three groups of participants were constituted. Each group corresponded to one of the three experimental conditions: *Low SES* ($n = 345$, 34.8%), *Medium SES* ($n = 327$, 33%) or *High SES* ($n = 319$, 32.2%). Stigma scores (means) were then compared between groups, using ANOVA and posthoc, for the following subscales: "*Negative attributions about people with health problems*", "*Causality of cancer*", "*Controllability of drinking*" and "*Reluctance to helping behavior*" (Table 2). Regarding the "*Negative attributions about people with health problems*" subscale, results showed that the *Low SES* group obtained higher scores than the *Medium SES* or *High SES* groups, with statistical significance ($p < 00.01$) and that there was no significant difference between the *Medium SES* and *High SES* groups. Regarding other subscales, there was no significant differences between the three groups. Results thus partially suggested that participants confronted with the experimental condition *Low SES* had a higher tendency to make negative attributions about the character, when compared with participants from the *Medium-* or *High-SES* groups.

3.3. Testing hypothesis 2: influence of health professional status on stigma scores

The aim of this analysis was to test hypothesis 2, predicting that participants from the *health professional subsample* would exhibit different stigma scores when compared to the *subsample of non-health professionals*. To test this hypothesis, participants were assigned to the *Health professional* subsample ($n = 375$, 37.84%) or the *Non-health professional* subsample ($n = 616$, 62.16%), depending whether or not they worked as health professional. Mean stigma scores for the four subscales were then compared between the two groups, using *t*-tests (Table 4). The results showed that, for the subscales "*Negative attributions about people with health problems*" and "*Controllability of drinking*", the *Health professional* group had lower scores than the *Non-health professional* group, with statistical

Table 1
Characteristics of the sample (N = 991; Mean age = 32.15 years, SD = 3.9).

	n	%
Gender		
Female	720	72.7
Male	259	26.1
Other	12	1.2
Marital status		
Single	391	39.5
As a couple	600	60.5
Number of children		
None	672	67.8
1 or 2	247	24.9
3 or more	72	7.3
Education		
High school or less	214	21.6
Undergraduate degree	392	39.6
Graduate degree or above	385	38.8
Occupational category		
Employee, high	299	30.2
Employee, intermediate	135	13.6
Employee, low	109	11
Retired	15	1.5
Unemployed	32	3.2
Student	369	37.2
Other	32	3.2
Health professionnal		
No	616	62.2
Yes	375	37.8
Category		
Paramedical pro. & nurse	278	74.1
Medical doctor	48	12.8
Caregiver & nurse assist.	31	8.2
Health executive	18	4.8
Alcohol consumption		
Low consumption	404	40.8
High consumption	587	59.2

Table 2
Descriptive statistics [M (SD)] for each experimental condition and group comparisons using ANOVA and post-hoc.

Variables	High (H)	Medium (M)	Low (L)	*F*	*p*	η_p^2	Significant
	n = 319 (32.2%)	*n = 327 (33%)*	*n = 345 (34.8%)*				comparisons
Negative attributions	8.01 (3.13)	8.14 (3.03)	8.77 (3.19)	5.51	0.004**	0.011	H < L; M < L
Causality of cancer	12.02 (2.84)	11.93 (2.78)	12.16 (2.56)	0.59	0.55	0.001	n.s.
Controlability drinking	14.92 (4.2)	14.41 (3.83)	14.36 (4.14)	2.02	0.13	0.004	n.s.
Reluctance to helping	6.26 (2.18)	6.06 (2.21)	6.36 (2.23)	1.59	0.20	0.003	n.s.

η2p = partial eta squared, n.s. = not significant, $^{**}p < 0.01$.

significance ($p < 00.01$ or 0.001). For the subscale "*Reluctance to helping behavior*", the *Health professional* group had higher scores than the *Non-health professional* group with statistical significance ($p < 00.01$), suggesting a tendency for less helping behaviors in the *Health professional* group. Regarding the "*Causality of cancer*" subscale, there was no significant difference between the two groups' mean scores.

3.4. Testing hypothesis 3: influence of participants' own alcohol consumption on stigma scores

The aim of this analysis was to test hypothesis 3, which predicted that participants with a higher alcohol consumption would exhibit lower stigma scores than participants with a lower consumption. To test this hypothesis, as described in the *Methods* section, each participant was assigned to one of the two following groups according to his/her AUDIT-C total score: *Low alcohol consumption* group ($n = 404$, 40.77%) and *High alcohol consumption* group ($n = 587$, 59.23%). Mean stigma scores for the four subscales *("Negative attributions about people with health problems", "Causality of cancer", "Controllability of drinking"* and *"Reluctance to helping behavior")* were then compared between these two groups, using *t*-test (Table 3). Results showed that, for the subscales *"Negative attributions about people with health problems", "Causality of cancer"* and *"Controllability of drinking"*, participants of the *High alcohol consumption* group exhibited lower scores than participants of the *Low alcohol consumption* group, with statistical significance ($p < 00.01$ or 0.001). These results suggested that participants from the *Low alcohol consumption* group had a higher tendency to stigmatize the character, compared with participants from the *High alcohol consumption* group. Regarding the "*Reluctance to helping behavior"* subscale, there was no significant difference between the two groups' mean scores.

To gain insight on relationships between stigmatization measures and demographic variables, multiple linear regression analyses were conducted while including age, gender and education level as independent variables to predict the scores of stigmatization measures. The results showed that the overall models were significant for the four stigmatization measures. The percent of explained variance (adjusted r squared) ranged between 3.1 and 5.5% (Table 5). Gender was a significant predictor for the four measures, where women were associated to lower scores than men. Age was a significant predictor only for "*Causality of Cancer"*, with negative relationship. Education level was a negative predictor for both "*Negative attributions about people with health problems*" and "*Controllability of drinking*", and a positive predictor for "*Reluctance to helping behavior*".

4. Discussion

The present study's first aim was to identify if a fictional character's SES, with both alcohol addiction and liver cancer, influenced the level of stigmatizing attitudes from participants. We hypothesized that participants confronted with the scenario depicting a character with low SES would present higher stigma scores when compared to participants confronted with a scenario describing a character with higher SES. Regarding the "*Negative attributions about people with health problems*" subscale, results showed that the *Low SES* group had significantly higher scores than the *Medium SES* or *High SES* groups. These results thus supported the hypothesis, at least partially, as they suggested that a person with lower SES is more prone to receive negative attributions from others about her supposedly "poor choices" and weakness, when compared with a person with higher SES. This finding is in agreement with, and might be explained by previous studies evaluating the general public's attitudes regarding SES, showing that people attributed better skills (intelligence and general competence) to persons from a higher social class, compared with those from lower social classes [54,80]. Nevertheless, additional investigations are required to identify other potential reasons of our findings.

This current study's results also showed that there was no difference between the three experimental conditions regarding two

Table 3
Descriptive statistics [M (SD)] for Low and High alcohol consumption groups and group comparisons using *t*-test (degree of freedom = 989).

Variables	Low consumption	High consumption	*t*	*p*	*Cohen's d*
	n = 404 (40.77%)	*n = 587 (59.23%)*			
Negative attributions	8.64 (3.27)	8.06 (3.02)	2.90	0.004**	0.19
Causality of cancer	12.41 (2.81)	11.78 (2.65)	3.61	<0.001***	0.23
Controllability drinking	15.05 (4.18)	14.24 (3.95)	3.10	0.002**	0.20
Reluctance to helping	6.35 (2.25)	6.14 (2.17)	1.50	0.13	0.10

$^{**}p < 0.01$, $^{***}p < 0.001$.

Table 4
Descriptive statistics [M (SD)] for the Health professionals and Non-health professionals groups and group comparisons using *t*-test (degree of freedom = 989).

Variables	Health pro.	Non-health pro.	*t*	*p*	*Cohen's d*
	n = 375 (37.84%)	*n = 616 (62.16%)*			
Negative attributions	7.94 (3.14)	8.52 (3.11)	−2.83	0.005**	−0.18
Causality of cancer	12.00 (2.64)	12.06 (2.79)	−0.34	0.73	−0.02
Controllability drinking	13.84 (3.79)	15.02 (4.17)	−4.48	<0.001***	−0.29
Reluctance to helping	6.47 (2.26)	6.08 (2.16)	2.74	0.006**	0.18

$^{**}p < 0.01$, $^{***}p < 0.001$.

Table 5
Multiple linear regression analyses predicting scores of indicated dependent variables (DV; n = 978).

	F	Adjusted r squared	Standardized Beta	*t*	*p*
DV: Negative attributions	14.39	0.039			<0.001***
Gender (male = 1 female = 2)			−0.13	−4.23	<0.001***
Age			0.07	2.34	0,02*
Education level			−0.16	−4.94	<0.001***
DV: Causality of cancer	18.88	0.052			<0.001***
Gender (male = 1 female = 2)			−0.21	−6.72	<0.001***
Age			−0.11	−3.31	0.001**
Education level			−0.06	−1.93	0.054
DV: Controlability drinking	19.88	0.055			<0.001***
Gender (male = 1 female = 2)			−0.18	−5.69	<0.001***
Age			−0.06	−1.74	0.082
Education level			−0.16	−5.05	<0.001***
DV: Reluctance to helping	11.49	0.031			<0.001***
Gender (male = 1 female = 2)			−0.14	−4.49	<0.001***
Age			0.04	1.23	0.22
Education level			0.08	2.63	0.009**

$^{*}p < 0.05$ $^{**}p < 0.01$ $^{***}p < 0.001$.

scales aiming to judge the character's behaviors, namely "Causality of cancer" and "Controllability of drinking". These results suggested that the character's SES level did not influence participants' attributions pertaining to the causality of her cancer nor her controllability of drinking. In addition, results pertaining to the "Reluctance to helping behavior" subscale suggested that participants would have a similar attitude when it comes to helping behaviors towards the fictional character, regardless her SES level.

This study's second objective was to identify whether participants' own personal characteristics, including alcohol consumption and being a health professional or not, would impact their level of stigmatization towards the fictional character. We hypothesized that participants who were health professionals would exhibit lower stigma scores in comparison to participants who were not health professionals. The results showed that, for the subscales "Negative attributions about people with health problems" and "Controllability of drinking", health professionals had lower stigmatizing scores than other participants, thereby confirming this hypothesis. This result suggested that, even if previous studies showed that health professionals could stigmatize patients [21,41,61,81], their stigmatization attitudes seemed to be lower than non-health professionals. Supporting this finding, a recent study showed that health professionals had higher acceptability scores regarding a fictious patient with lung cancer who continued smoking, when compared with participants who were not health professionals [82]. The underlying explanations behind these observations remain to be identified. Yet, a plausible interpretation could be that health professionals have greater knowledge regarding health and medicine. Indeed, previous studies [13,45,59] have evidenced that a higher level of information in these matters could lead to a reduction in stigma. Paradoxically, our study's results also showed that health professionals had higher scores on the "Reluctance to helping behavior" subscale, in comparison with non-health professionals. A plausible explanation could be that, since health professionals' jobs imply helping and caring for others, outside their workplace they would perceive less the need to help others.

Our third hypothesis predicted that participants with higher alcohol consumption would display lower stigma scores than participants with lower consumption. Results supported this hypothesis, showing that, for three out of four subscales, participants from the High consumption group exhibited lower stigma scores than participants from the Low consumption group. This finding suggested that individuals with a higher level of alcohol consumption were potentially less stigmatizing towards a drinker than individuals with a lower level of alcohol consumption. These results are similar to those found in two previous studies that focused on the stigma of drug addiction or smoking in lung cancer, respectively [19,83]. Indeed, these studies showed that participants, who themselves had higher consumption levels, expressed lower stigmatization scores than participants with lower consumption levels. These results could be explained by the fact that when someone is familiarized with a disorder, she/he tends to be less stigmatizing towards it [84].

4.1. Limitations

This study is not exempt from limitations. Firstly, it used a convenience sample of moderate size and composed by individuals leaving in France. Secondly, the majority of participants were women. Generalization of the findings should thus be done with care. Thirdly, the fictional character depicted in the scenarios was a female. Therefore, whether the character's gender had an influence on participants' positions was not explored, as testing the gender effect (e.g., woman vs. man) would have introduced an additional factor, requiring at least a doubling of experimental conditions. Fourthly, this study employed a cross-sectional research design, which may involve issues related to internal validity and external validity. Therefore, further research is needed to validate the reliability and generalizability of the results. Longitudinal studies are required to establish the relationships among alcohol consumption, stigmatization, liver cancer, and socioeconomic status more conclusively. Finally, this study was conducted in France, and the results may be influenced by the cultural and environmental factors specific to that region. More research is needed to assess the generalizability of the findings to other regions or populations.

Despite these limitations, the strengths of this study include a substantial number of participants (991), the diversity of the sample, including health professionals and non-health professionals, individuals with different alcohol consumption levels, and various socioeconomic backgrounds. In addition, the study employs a variety of statistical analyses, such as ANOVA, t-tests and multiple linear regression, and assesses stigma across multiple dimensions, including negative attributions about people with health problems, causality of cancer, controllability of drinking, and reluctance to helping behavior.

4.2. Future research

Our findings underscore the influence of socio-demographic factors on negative attributions among participants. Further investigation into additional participant-related factors associated with these judgments and attributions is warranted. For instance, considering that past research highlighted that personality traits, empathy levels, and health literacy can impact stigmatization [43,85–87], it could be interesting to explore the involment of these traits in stigmatization attitudes toward patients with liver cancer and alcohol consumption. Additionally, implementing and evaluating stigma reduction programs for patients with preventable cancers, inspired by a successful intervention with primary care physicians [88], could be valuable. This assessment should target both healthcare professionals and the general population, considering our findings that the latter may display more stigmatizing attitudes. Effective interventions should prioritize knowledge development related to addictive disorders and cancers [41,62,89]. Regarding liver cancer, health psychology research is currently limited, and future studies should concentrate on patients' mental health and should test interventions aiming to improve their psychological and social well-being, with or without a focus on stigmatization [52].

4.3. Clinical implications

In terms of clinical implications, this study suggests that future preventive campaigns aiming to reduce stigmatization of patients with liver cancer should take into account patients' SES, as a lower SES was associated with higher negative attributions from others. Reducing perceived stigmatization through these campaigns could result in a better adherence to screening campaigns or/and to treatments once the diagnosis is made.

From a psychotherapeutic perspective, this study's results, along with existing literature, indicate that individuals with low SES may experience greater stigmatization. It would be thus valuable for clinical psychologists to intervene early with such individuals diagnosed with liver cancer and alcohol consumption to mitigate the negative effects of stigma. In this context, several studies highlighted the effectiveness of Cognitive-Behavioral Therapy specifically addressing the erroneous beliefs that individuals with various diseases may hold about themselves regarding perceived stigma [89].

5. Conclusion

In conclusion, previous studies have demonstrated that stigma related to liver cancer can entail an additional burden for patients, especially considering beliefs and atttitudes associating liver cancer with alcohol consumption. Reducing stigma surrounding liver cancer and alcohol consumption appears imperative and would be beneficial for improving patients' adherence to screening campaigns and healthcare-seeking behaviors following diagnosis. To alleviate stigma, it seems crucial to identify underlying factors. This study aimed to identify them and address certain gaps in the literature. Specifically, this research describes a systematic study identifying whether the SES level influences the stigmatization of drinkers diagnosed with liver cancer. Its results showed that a fictional character with a low SES received more negative attributions than one with a higher SES. This study also showed that participants' own personal characteristics, including alcohol consumption and being a health professional or not, influenced their stigmatizing attitudes, as being health professional or having higher alcohol consumption was associated to lower stigmatization attitudes.

Statement of ethics

The study protocol was in accordance with the Helsinki Declaration and approved by the local ethics committee (Comité d'Ethique de la Recherche of Toulouse University, file number 2022-462) and the Data Protection Officer of the University of Toulouse.

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Data availability statement

Data are fully available at https://doi.org/10.5281/zenodo.8186535.

CRediT authorship contribution statement

Camille Auriol: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Writing – original draft, Writing – review & editing. **Patrick Raynal:** Conceptualization, Data curation, Formal analysis, Supervision, Writing – review & editing. **Nicole Cantisano:** Conceptualization, Formal analysis, Methodology, Supervision, Writing – review & editing.

Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

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Appendix A

High socioeconomic status

Anna is a 42-year-old woman. During her youth, she had attended a recognized business school. It was around this time that she began to drink frequently. After five years of study, she graduated with a Master degree in business management and later became CEO of a large IT company, in which she still works today. Despite this position of responsibility, she manages to free up time to go on vacation to her second homes, winter in the Alps and summer on the Croisette. Anna has seen her consumption of alcoholic beverages increase over the years. Although she has tried, without success, to reduce her consumption on several occasions, she currently consumes a bottle of wine a day. Recently, following pain in the upper part of the abdomen, accompanied by significant weight loss, she undertook medical procedures. The medical results then show that she has liver cancer, a disease that may be linked to alcohol consumption.

Medium socioeconomic status

Anna is a 42-year-old woman. During her youth, she had completed a bachelor degree in business management. It was around this time that she began to drink frequently. After three years of study, she obtained her diploma and later became a secretary in a small insurance company, in which she still works today. Installed in a small house, she repays her loan every month. Anna has seen her consumption of alcoholic beverages increase over the years. Although she has tried, without success, to reduce her consumption on several occasions, she currently consumes a bottle of wine a day. Recently, following pain in the upper part of the abdomen, accompanied by significant weight loss, she undertook medical procedures. The medical results then show that she has liver cancer, a disease that may be linked to alcohol consumption.

Low socioeconomic status

Anna is a 42-year-old woman. During her youth, she had to stop her studies and look for a job at the age of 16. It was around this time that she began to drink frequently. After several years of working as a supermarket employee, she experienced economic redundancy, followed by many years of unemployment. Today, she is still struggling to get by, she is a beneficiary of social welfare benefits and lives in public housing. Anna has seen her consumption of alcoholic beverages increase over the years. Although she has tried, without success, to reduce her consumption on several occasions, she currently consumes a bottle of wine a day. Recently, following pain in the upper part of the abdomen, accompanied by significant weight loss, she undertook medical procedures. The medical results then show that she has liver cancer, a disease that may be linked to alcohol consumption.

Appendix B

Negative attributions about people with health problems

- People with health problems like Anna's tend to make poor choices.
- People with health problems like Anna's tend to have little will.
- People with health problems like Anna's tend to lack common sense.
- People with health problems like Anna's tend to be inconsiderate of others.

Causality of cancer

- Anna could not have avoided her cancer.
- Anna caused her cancer.
- Anna's cancer is a consequence of these behaviors.
- Anna is not responsible for the appearance of her cancer.

Controllability of drinking

- Anna can choose not to drink alcohol.
- Drinking alcohol is a behavior that Anna cannot control.
- No one is forcing Anna to drink alcohol.
- It's Anna's personal choice whether or not to drink alcohol.
- Anna couldn't do otherwise drink alcohol during her life.

Reluctance to helping behavior

- If I were close to Anna, I could help her carry her groceries if she needed it.
- If I were close to Anna, I could drive her to her medical appointments if she needed it.
- If I were close to Anna, I would take care of her pets if she needed it.
- If I were close to Anna, I could water her plants if she needed it.

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